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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,724	12/28/2001	John DiDomenico	87354.2902	4069

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EXAMINER

SUNG, CHRISTINE

ART UNIT PAPER NUMBER

2878

DATE MAILED: 09/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,724

Applicant(s)

DIDOMENICO ET AL.

Examiner

Christine Sung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-11, 13-16, 18 and 20-23 is/are rejected.
- 7) ☒ Claim(s) 5, 12, 17 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: Figure 5, element 49; Figure 8, element 204; Figure 13, element 150; and Figure 14, elements 214 and 216. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: On page 18 of the specification, elements 52 and 54 of figure 4. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 4 is objected to because of the following informalities: Claim 4 recites the limitation "second emitters," "second beams" and "second receivers" throughout the claim. There is insufficient antecedent basis for this limitation in the claim. The examiner assumes that the claim is intended to be dependent upon claim 2.
4. Claim 5 is objected to because of the following informalities: Claim 5 recites the limitation "the reflectors" throughout the claim. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-4, 6-11, 13-16, 18 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lord (US Patent 6,455,851) in view of Fellows (US Patent 6,281,498).

Regarding claims 1, 2, 6-7, 11, 14 and 21-23, Lord discloses an optical system for a gas component analysis, comprising:

A first emitter (Figure 1, element 10), of IR radiation (column 4, line 50) located on a first side of a vehicle path for emitting a first light beam having a first spectrum across the vehicle path (See Figure 1);

A first receiver for receiving the first light beam (Figure 3, element 48);

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A second emitter (Figure 1, element 12), of UV radiation (column 4, line 51) located on the first side of the vehicle path for emitting a second light beam at a second spectrum across the vehicle path (See figure 1);

A second receiver for receiving the second light beam (Figure 3, element 52);

Lord does not disclose the use of a spinning filter wheel that filters the beam from the first emitter before it crosses the vehicle path. However, spinning filter wheels are well known in the art, and are mainly used to filter a particular the wavelength or set of wavelengths that are desired for a particular application. Fellows discloses a IR measuring gauge that employs a filter wheel with a plurality of filter elements (see Figure 2, elements 14, 18). Fellows discloses that the filter wheel can, for example contain 5 filter elements (See column 4, lines 38-41). Further, Fellows discloses that the spinning filter wheel filters the beam from the emitter or source before it crosses the area of interest or sample (See figure 2). It would have been obvious to one having ordinary skill in the art at the time in invention was made to have used the invention as disclosed by Lord with the spinning filter as disclosed by Fellows in order to expose the sample only to the desired measuring wavelengths, because IR sources generate a broad emission spectra and unnecessary wavelengths may reduce accuracy of the readings.

Regarding claim 4, Lord further discloses an optical system wherein the light beam is projected across a vehicle path and the first and second emitters and first and second receivers are located on one side of the vehicle path and wherein the system comprises a reflector (Figure 1, element 16) located at the other side of the vehicle path to direct the first and second beams from the first and second emitters to the first and second receivers respectively (Figure 1).

Regarding claim 3, Lord in view of Fellows discloses the claimed invention except for the addition of a third emitter and a third light receiver for detecting the third light beam wherein the third light beam path overlaps the second light beam path. It would have been an obvious matter of design choice to have a third emitter and receiver whose beam path overlaps the second beam path, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St Regis Paper Cp. V. Bemis Co.*, 549 F.2d 833, 193 USPQ 8 (CA 71977).

Regarding claim 9, Lord discloses an IR and UV radiation source but does not specifically disclose the use of a separate Visible radiation source, but rather discloses a combinatory UV-VIS radiation (column 8, lines 24-28) to image the exhaust plume. The visible range is typically used to detect the presence of exhaust or a plume, but could further be used to detect erroneous plumes, i.e. excessive burning of oils. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have separated the UV-VIS source radiation into separate UV and Visible radiation, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179 (BdPatApp&Int 1969).

Regarding claims 8 and 10, Lord further discloses that the first and second beams overlap (see figure 1), as they are both reflected from the same point of the reflector. Further, since the first and second beams can be overlapped, and combination of the beams can be overlapped, as it would only be a matter of design choice.

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Regarding claim 13, Fellows further discloses that after required wavelengths have been selected the appropriate filters are incorporated into the filter wheel (Column 5, lines 9-11).

Therefore it is inherent that the filter elements are removable.

Regarding claim 15, Fellows further discloses that the filter elements are disposed at regular angular intervals around the wheel (column 5, lines 38-53, Figure 2).

Regarding claim 16, although Fellows only discloses using a single filter element to achieve a desired source radiation wavelength, it is a well known that filters can be combined to create the desired wavelengths for particular applications. For example, a filter A that blocks radiation from ranges 1-5, and 9-10, therefor allowing only radiation from 6-8 to pass. This range can also be achieved by using two filters simultaneously, B and C, whereby B is responsible for blocking radiation from 1-5 and C is responsible for wavelength 9-10. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used two filters simultaneously, instead of one, to direct the desired source radiation.

Regarding claim 18, Fellows discloses a synchronization feature (Figure 2, element 46) on the wheel that determines the position of the wheel indicating the filter position (See column 5, lines 38-53).

Regarding claim 20, Fellows further discloses that the filter wheel is located proximate to the first emitter or source (see figure 2).

Allowable Subject Matter

8. Claims 5, 12, 17 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Regarding claim 5, none of the prior art of record discloses the specific three-sided retroreflector that directs incoming radiation and outgoing radiation at heights relative to each other. Although references like Johnson (US Patent 5,343,043) disclose a lateral, three-sided transfer mirror, the incoming and outgoing beams are returned at the same height. None of the references searched disclosed the relative height differences of the outgoing and incoming beams.

Regarding claim 12, none of the prior art of record specifically discloses the shape of the filter elements to be quarter circular. Although many references such as Fellows (US Patent 6,281,498) disclose such conventional filter wheels, none of the references searched disclose such a filter element shape.

Regarding claims 17 and 19, none of the prior art of record discloses measuring the speed of rotation of the wheel; rather, other references such as Fellows are concerned with the position of the wheel. Fellows uses a holed filter wheel that discloses the position of the wheel using a simple photoelectric emitter and sensor to detect the number of holes that pass the photoelectric sensor. None of the prior art of record discloses determining the speed of rotation of the wheel, but rather are more concerned about the relative positioning of the wheel.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. US Pre Grant Publication 2003/0089854- this reference discloses a method and apparatus for detecting pollutants in an exhaust plume using IR and UV radiation.
- b. US Patent 5,343,043- this reference discloses using a 3-sided retroreflector.


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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Sung whose telephone number is 703-305-0382. The examiner can normally be reached on Monday- Friday 7-4 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 703-308-4852. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

CS
August 25, 2003



DAVID PORTA
SUPERVISORY PATENT EXAMINER
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